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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ROBINSON, ELIZABETH A

ART UNIT

PAPER NUMBER

1794

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/553,985	Applicant(s) ITO ET AL.	
	Examiner Elizabeth Robinson	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 15-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 15-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12-21-07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1 and 15-43 are currently pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 23, 25-26, 28-29, 31-32, 34, 36-37, 39-40 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 23 and 25 both state a limitation that one of the layers contains no light diffusing agent. All materials diffuse light in some manner, including resins with no additional particles. In order to further prosecution, the Examiner is interpreting the claims to mean that no additional particles are added to a resin layer. Claims 26, 28-29, 31-32, 34, 36-37, 39-40 and 42 all depend from claim 23 or 25 and are thus, also rendered indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 15-28 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al. (JP 2003-107212), in view of Glatkowski (WO 2002/076724). A formal English translation of Okabe is provided with this Office Action.

Regarding claim 1, Okabe (Paragraph 23) teaches a light-diffusing sheet (optical layer 3) that comprises a binder (5) and a light-diffusing agent (6). Okabe (Paragraph 40) further teaches that a metallic-oxide film (4) can be laminated to the front face of optical layer 3. Okabe (Paragraph 11) teaches that the metallic-oxide film is an electromagnetic-wave shielding material, preferably indium tin oxide (ITO), which is excellent in conductivity and transparency. The surface resistivity of the layer is below $500 \Omega/\square$ (Paragraph 12). Okabe does not teach that the electroconductive layer contains ultrafine electroconductive fibers. Glatkowski (Page 1, line 20 through Page 2, line 6) teaches that electroconductive ITO films require a complicated apparatus. As an alternative, Glatkowski (Page 3, lines 23-25) teaches an electrically conductive film comprising carbon nanotubes (ultrafine electroconductive fibers). The film can be used for EMI/RFI shielding (Page 9, lines 13-16). The surface resistivity for EMI/RFU shielding is less than $10^4 \Omega/\square$ (Page 9, lines 20-22). It would be obvious to one of ordinary skill in the art to use the carbon nanotube film of Glatkowski, as the electroconductive layer of Okabe, in order to form a light diffusing sheet that is simpler to manufacture.

Regarding claims 15-17, Glatkowski (Page 13, lines 1-15) teaches that the carbon nanotubes can be homogeneously dispersed throughout a polymeric material and appropriate processing control can achieve a desired array of nanotubes.

Regarding claim 18, Glatkowski (Page 10, line 26 through Page 11, line 1) teaches that the electroconductive film has a thickness between 0.5 nm and 100 microns. This range fully encompasses the thickness range of the instant claim. Glatkowski does not explicitly teach the density of carbon nanotubes in the electroconductive layer. However, Glatkowski (Page 13, lines 1-3) teaches that the amount of nanotubes in the film can be optimized for a desired purpose using only a few routine parametric variation tests. It would be obvious to one of ordinary skill in the art to vary the amount of carbon nanotubes in the film, in order to obtain a film with desired properties.

Regarding claim 19, Glatkowski (Page 10, lines 10-21) teaches that the total light transmittance of the electroconductive layer is 60 to 95% or more and that the haze of this layer about 0.5 to 2% or less. Thus, this layer can be formed such that it causes little increase of haze or decrease of transmittance. Okabe (Paragraph 23) teaches that the other layer of the light diffusing sheet is formed from a binder and light diffusing agent. The resin of the light diffusing layer (Paragraph 24) is colorless and transparent in order to transmit the light. The light diffusing agent is mixed with the polymer binder at a ratio of 0.1 to 500 parts light diffusing agent to 100 parts binder. If too little light diffusing agent is added to the binder the diffusion (haze) becomes insufficient. The amount of light diffusing agent can be varied over a wide range and would be a results effective variable that would determine the total light transmittance and haze of the light diffusing layer. It would be obvious to one of ordinary skill in the art to vary the amount

of light diffusing agent in the binder, in order to obtain a light diffusing sheet that has the desired optical properties.

Regarding claim 20, Glatkowski (Page 13, lines 16-17) teaches that the nanotube film can be over-coated with a polymeric material.

Regarding claim 21, Okabe (Paragraph 23 and Figure 1) teaches that the light-diffusing agent can project from the binder. This results in fine recesses and protrusions being formed on the surface of the light-diffusing sheet.

Regarding claim 22, the light diffusing agent is mixed with the polymer binder at a ratio of 0.1 to 500 parts light diffusing agent to 100 parts binder. This range of particle loading fully encompasses the range of the instant claim.

Regarding claim 23, Okabe (Paragraph 20) teaches that the light diffusing sheet main body can comprise a substrate layer and a light diffusion layer. The light diffusion layer can be considered to be the core layer and it contains light diffusing agent. The substrate layer (Paragraph 21) is formed of a transparent resin and can be considered to be a surface layer.

Regarding claims 24, Okabe (Paragraph 21) teaches that the substrate layer can comprise inorganic particles. These particles would be light diffusing agents.

Regarding claim 25, the light diffusing layer can be considered to be the surface layer and the transparent resin substrate with no additional particles can be considered the core layer.

Regarding claims 26-28, Okabe (Paragraphs 21 and 24) teaches resins for the substrate and light diffusing layer. These lists both include resins with high and low refractive indices and thus the limitations of the instant claims can be met.

Regarding claim 36, Okabe (Paragraphs 21 and 25) teaches that the substrate and light diffusion layers can comprise zinc oxide. As evidenced by the Hawley's Condensed Chemical Dictionary, 14th edition - Zinc Oxide definition, zinc oxide is a UV absorber.

Claims 29-35 and 37-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al., in view of Glatkowski as applied to claims 26-28 above, and further in view of Iwata et al. (JP 2002-221612). A machine translation of Iwata is provided with this Office Action. A formal English translation of this document will be provided with the next Office Action.

Regarding claims 29-35, as stated above, the light diffusing sheet of Okabe, using the electromagnetic shielding layer of Glatkowski, meets the limitations of claims 26-28. Okabe (Paragraph 24) teaches some example resin compounds for the light diffusing layer, but does not preclude other resins for this layer as long as the resin is transparent. Okabe does not explicitly teach polypropylene or polycarbonate as the resin for this layer. Iwata (Paragraph 1) teaches an optical diffusion sheet for a back light unit of a liquid crystal display. Iwata (Paragraph 22) teaches that the resin of the light diffusing layer can be a polycarbonate or even more preferably a polypropylene, since it does not deform from heat. It would be obvious to one of ordinary skill in the art

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to form the light diffusing layer, of Okabe, from a polycarbonate or polypropylene resin, which has been shown, by Iwata, as being preferred resins for a light diffusing layer.

Okabe (Paragraph 25) teaches that the light diffusion agent can be magnesium silicate (talc is a magnesium silicate) or acrylic resins. As stated above, the light diffusing agent is mixed with the polymer binder at a ratio of 0.1 to 500 parts light diffusing agent to 100 parts binder. This range of particle loading fully encompasses the range of the instant claims. Finally, Okabe (Paragraph 17 and Figure 2) teaches that an anti-sticking layer can be formed on the opposite side of the substrate layer from the light dispersing layer. This layer comprises beads in a binder and, as shown in Figure 2, has recesses and protrusions.

Regarding claims 37-43, as stated above, Okabe (Paragraphs 21 and 25) teaches that the substrate and light diffusion layers can comprise zinc oxide, which is a UV absorber.

Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Due to amendment to the claims, the rejections and objections from the August 7, 2007 Office Action are withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Robinson whose telephone number is 571-272-7129. The examiner can normally be reached on Monday- Friday 8 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SUPERVISORY PATENT EXAMINER